



CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005



Job No.: CTCE/BBMP/W.No.08/KMG/WMM/Gradation/2014-15



13.08.2014

GRADATION FOR WMM MORTH TABLE-400-11

Client : Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.

Agency : Mr. K.M. Giri, Contractor, Bangalore.

Name of Work : Asphaltting to roads and Improvements of drains in Devinagara Surroundings in Ward No.08 (Kodigehalli), BBMP, Bangalore.

Reference : AEE/KG/(WO)/44/2014-15 Dated: 11.08.2014

Date of Testing : 13.08.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): 24880

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	925	925	3.7	96.3	95-100
22.4	5845	6770	27.2	72.8	60-80
11.2	5295	12065	48.5	51.5	40-60
4.75	4150	16215	65.2	34.8	25-40
2.36	3805	20020	80.5	19.5	15-30
0.600	2220	22240	89.4	10.6	8-22
0.075	2355	24595	98.9	1.1	0-8

Note:

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Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone B.B.M.P.,
Bangalore.


M/s. Civil-Tech Consultants & Engineers
23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.

Tele Fax : 23223227, Website : www.civiltechconsultants.com

E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com



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Date of Testing : 13.08.2014

Material : WMM

Sample Location : WMM Mix Plant

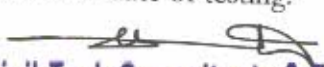
Oven Dry Wt (gm): 25210

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	955	955	3.8	96.2	95-100
22.4	5920	6875	27.3	72.7	60-80
11.2	5310	12185	48.3	51.7	40-60
4.75	4195	16380	65.0	35.0	25-40
2.36	3905	20285	80.5	19.5	15-30
0.600	2215	22500	89.3	10.7	8-22
0.075	2415	24915	98.8	1.2	0-8

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Bangalore.


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4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

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Reference : AEE/KG/(WO)/44/2014-15 Dated: 11.08.2014

Date of Testing : 13.08.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): 25305

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	855	855	3.4	96.6	95-100
22.4	6025	6880	27.2	72.8	60-80
11.2	5265	12145	48.0	52.0	40-60
4.75	4155	16300	64.4	35.6	25-40
2.36	3895	20195	79.8	20.2	15-30
0.600	2310	22505	88.9	11.1	8-22
0.075	2405	24910	98.4	1.6	0-8

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Kodigehalli Sub Division
Yelahanka Zone, B.B.M.
Bangalore.

M/s. Civil-Tech Consultants & Engineers
23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079,

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.

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E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com



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Job No.: CTCE/BBMP/W.No.08/KMG/WMM/AIV/2014-15



13.08.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr. K.M. Giri, Contractor, Bangalore.
Name of the Work	Asphalting to roads and Improvements of drains in Devinagara Surroundings in Ward No.08 (Kodigehalli), BBMP, Bangalore.
Reference	AEE/KG/(WO)/44/2014-15 Dated: 11.08.2014
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	13.08.2014

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	385	386	21.92
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	84	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines	21.82	22.02	
	$100 * (W_2/W_1) \%$			

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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[Signature]
Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.D.
Bangalore.

[Signature]
M/s. Civil-Tech Consultants & Engineers
23/14, 7th Cross, 3rd Stage,
4th Block, Shakhiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakhiganapathinagara, Basaveshwaranagar, Bangalore-79.

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13.08.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr. K.M. Giri, Contractor, Bangalore.
Name of Work	Asphalting to roads and Improvements of drains in Devinagara Surroundings in Ward No.08 (Kodigehalli), BBMP, Bangalore.
Reference	AEE/KG/(WO)/44/2014-15 Dated: 11.08.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	13.08.2014



Result : Flakiness Index = 11.23%

Elongation Index = 13.25%

Result : Combined Flakiness & Elongation index 24.48%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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M/s. Civil-Tech Consultants & Engineers

23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone - B.B.M.P.
Bangalore.



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Job No.: CTCE/BBMP/W.No.08/KMG/SDBC/AIV/2014-15



18.08.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr. K.M. Giri, Contractor, Bangalore.
Name of the Work	Asphalting to roads and Improvements of drains in Devinagara Surroundings in Ward No.08 (Kodigehalli), BBMP, Bangalore.
Reference	AEE/KG/(WO)/44/2014-15 Dated: 11.08.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	18.08.2014

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	383	380	20.58
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	78	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	305	301	
4	Aggregate Impact value = percent fines $100 * (W_2/W_1)\%$	20.37	20.79	

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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mf
Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, B.B
Bangalore

[Signature]
M/s. Civil-Tech Consultants & Engineers

23/14, 7th Cross, 3rd Stage,
4th Block, Shakhthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakhthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.

Tele Fax : 23223227, Website : www.civiltechconsultants.com

E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com



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Job No.: CTCE/BBMP/W.No.08/KMG/SDBC/Shape_T/2014-15

: 13.08.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: Mr. K.M. Giri, Contractor, Bangalore.
Name of Work	: Asphaltting to roads and Improvements of drains in Devinagara Surroundings in Ward No.08 (Kodigehalli), BBMP, Bangalore.
Reference	: AEE/KG/(WO)/44/2014-15 Dated: 11.08.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 13.08.2014



Result : Flakiness Index = 12.35%

Elongation Index = 13.95%

Result : Combined Flakiness & Elongation index 26.30%

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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M/s. Civil-Tech Consultants & Engineers
23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

[Signature]

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.



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Job No.: CTCE/BBMP/W.No.08/KMG/SDBC/Stripping/2014-15

13.08.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr. K.M. Giri, Contractor, Bangalore.
Name of the work	Asphalting to roads and Improvements of drains in Devinagara Surroundings in Ward No.08 (Kodigehalli), BBMP, Bangalore.
Reference	AEE/KG/(WO)/44/2014-15 Dated: 11.08.2014
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	13.08.2014



Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.2	3.30	96.70
2	3.3		
3	3.4		



Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

M/s. Civil-Tech Consultants & Engineers
23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.



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Job No.: CTCE/BBMP/W.No.08/KMG/SDBC/Sp_Wa/2014-15

13.08.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr. K.M. Giri, Contractor, Bangalore.
Name of the Work	Asphalting to roads and Improvements of drains in Devinagara Surroundings in Ward No.08 (Kodigehalli), BBMP, Bangalore.
Reference	AEE/KG/(WO)/44/2014-15 Dated: 11.08.2014
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	13.08.2014



Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2021	2022	2023	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1266	1267	1268	
4	Weight of saturated surface dry aggregate in air	W_3 g	2016	2017	2018	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_s)$ g	750	750	750	
6	Weight of oven dried aggregate	W_4 g	1998	2003	2006	2.670
7	Specific Gravity	$W_4 / (W_3 - W_s)$	2.664	2.671	2.675	
8	Apparent Specific gravity	$W_4 / (W_4 - W_s)$	2.730	2.721	2.718	2.723
9	Water Absorption	$((W_3 - W_4) * 100) / W_4$	0.90%	0.70%	0.60%	0.73%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.4%

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Kodigehalli Sub Division,
B.B.M.P.,
Bangalore

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4th Block, Shakthiganapathinagara,
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Job No.: CTCE/BBMP/W.No.08/KMG/SDBC/Bitumen/2014-15

22.08.2014

BITUMEN CONTENT AND GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

Client	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	Mr. K.M. Giri, Contractor, Bangalore.
NAME OF THE WORK	Asphalting to roads and Improvements of drains in Devinagara Surroundings in Ward No.08 (Kodigehalli), BBMP, Bangalore.
REFERENCE	AEE/KG/(WO)/44/2014-15 Dated: 11.08.2014
SAMPLE I/D	Roads in Devinagara Surroundings in Ward No.08, BBMP, Bangalore.
DATE OF TESTING	22.08.2014



BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted,	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	5.10	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOB MIX
mm	Weight Retained, gm	% Retained	% Cumulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	33.32	7.01	7.01	92.99	90-100
4.75	258.6	54.44	61.46	38.54	35-51
2.36	38.25	8.05	69.51	30.49	24-39
1.18	36.32	7.65	77.16	22.84	15-30
0.3	40.25	8.47	85.63	14.37	9-19
0.075	41.22	8.68	94.31	5.69	3-8

SIEVE SIZE	Trail 2				JOB MIX
mm	Weight Retained, gm	% Retained	% Cumulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	33.2	6.64	6.64	93.36	90-100
4.75	265.1	53.02	59.66	40.34	35-51
2.36	60.32	12.06	71.72	28.28	24-39
1.18	45.35	9.07	80.79	19.21	15-30
0.3	36.32	7.26	88.06	11.94	9-19
0.075	28.56	5.71	93.77	6.23	3-8

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Bangalore.

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E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

